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# Feature Article

## THE OIL PRICE COLLAPSE: SOME EFFECTS ON THE SCOTTISH ECONOMY

Alex Salmond, Royal Bank of Scotland

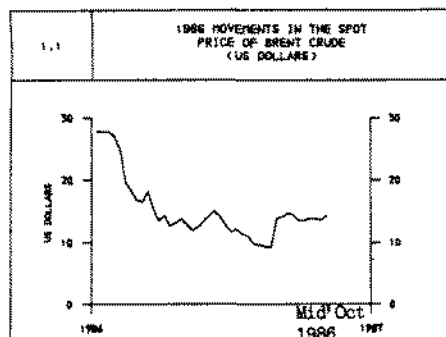
Jim Walker,

Fraser of Allander Institute, University of Strathclyde

### 1. Background to the collapse

A major factor affecting Scottish economic activity in 1986 has been the collapse in world oil prices. Figure 1.1 shows how the spot price of North Sea oil has fallen by around 50% since the beginning of the year. In the short run oil markets and prices are dominated by OPEC supply decisions (ie how much oil is released onto the market or rather how much oil the cartel is able to keep off it). In the medium-term, however, the key factors controlling prices are total demand and the availability of non-OPEC suppliers. Thus in the four years from 1980, the year of the last OPEC price 'hike', OPEC found it increasingly difficult to hold dollar prices in the face of an 11.5% decline in world oil demand and a substantial rise in non-OPEC production. Until last year Saudi Arabia, the cartel's largest producer and effectively its output regulator, took the strain and her exports of crude fell by almost 60% from 1979-84 compared with an OPEC average of just over 40%. In mid-1985 Saudi adopted a new strategy designed to recapture market share and to discipline both recalcitrant OPEC members and unco-operative non-OPEC suppliers like the UK. In the second half of the year Saudi production doubled and pricing was moved onto an increasingly aggressive basis (the strategy devised by the now deposed Saudi oil minister, Sheikh Yamani).

To a large extent Saudi has achieved her aims albeit at a high penalty in terms of lost oil revenues for the OPEC countries. A limited amount of high cost non-OPEC oil has been pushed off the market, there have been offers of co-operation from most non-OPEC suppliers (with the notable exception



of the UK) while Saudi's errant partners have been brought more into line. Most successful of all, however, has been the crushing impact of low oil prices on exploration and development work in high cost areas such as the North Sea. This brings closer the day when Saudi and OPEC can hope to reassert market control.

These dramatic events have had and are continuing to have major impacts throughout the UK and Scottish economies. In contrast to the main influences on the economy in 1984 and 1985 ie the phasing out of capital allowances on investment and the miners' strike, which were domestic issues. It has been argued that the oil price fall is an event outside the control of the UK government. However, government policy has had an influence in the present destabilisation of world oil markets both through the UK's long-standing high depletion policy and its more recent market-related stance on pricing adopted with the decision to abolish the British National Oil Corporation in early 1985 ie. to make no

effort to bolster oil prices through support buying. In Scotland, investment is expected to be hit badly since businesses with interests in the North Sea are estimated to account for 20% of total Scottish private non-residential investment. The Fraser of Allander Institute has forecast that total investment will grow by only 1.8% in 1986. In contrast, according to comparisons of outside forecasts undertaken by the Treasury, the average UK fixed investment growth rate forecast stands at 2.9% (although the usually optimistic London Business School believes it will be only 2%). On the other hand, consumers' expenditure and industrial activity in oil consuming sectors is expected to increase with the fall in inflation and energy costs which have accompanied the reduction in the oil price. Nevertheless, increasing unemployment, much of it caused by the fall in oil prices, will also play a part and consumers' expenditure in Scotland is expected to underperform the corresponding UK measure.

The oil price fall carries serious implications for oil producing and exporting economies, such as Scotland, although it shall have beneficial effects in lowering costs in the non-oil producing LDCs and net oil importing countries as well as on the non-oil related, or oil consuming, sectors of the UK and Scottish economies. Other forecasters and commentators on the UK economy, eg the London Business School, the National Institute of Economic and Social Research and HM Treasury have tended towards the view that the macroeconomic repercussions of the oil price fall will have a net beneficial or broadly neutral effect on the UK economy albeit, in some cases, via an exchange rate correction. They argue that the initial adverse terms of trade, current account and government revenue effects will, in time, be more than balanced by the increased activity induced through higher productive potential domestically and internationally and the expansion of world trade.

Both nationally and internationally, the immediate impact of lower oil prices is negative on demand as the 'losers' (oil producing states, net oil exporters and oil related companies) tend to adjust more quickly to the new economic circumstances than the 'winners' (oil consuming countries and non-oil industries). Thus

the impact of a collapse in oil prices is not the reciprocal of an oil price 'hike'. In the international economy the hoped for beneficial effects of low oil prices depend on how quickly the supply side benefits can outweigh the immediate depressionary effects on world demand. In time the impact is likely to be positive assuming that the low oil price regime does not lead directly to serious economic dislocation (through, for example, a banking default from an indebted oil producer). Balanced against this is the danger that the oil price fall will be followed after a few years by an oil price shock upwards which would be unambiguously negative for world growth.

As far as the UK economy is concerned the position is even more uncertain. The UK would benefit from any boost to world growth but macro-policy has already been severely 'crowded-in' by exchange rate pressures arising directly from lower oil value. In addition, at best, the UK will face a position where major competitors are experiencing relatively larger benefits from cheaper energy. It would seem unlikely that the UK, as a country currently producing oil at almost double domestic requirements, has economic interests identical to those of her energy consuming European partners. Nor is it a particularly good argument to suggest (as the Bank of England (1982) has done) that, through time, the UK is a net oil consumer and therefore has an interest in low oil prices. In fact the current level of oil prices is likely to lead to lower UK oil production in the early 1990's when prices could be significantly higher. Unfortunately for the UK, present prices are directly related to future production but inversely related to future prices (as current low prices depress development activity in high cost areas, such as the North Sea, then low production cost areas, such as the Middle East, corner more and more of an expanding world market for oil. This provides the cartel with the opportunity for raising prices in the future).

Scotland would seem to be a clear 'loser'; in that group of oil exporting states and oil related industries which are feeling the immediate and adverse impact of the oil price collapse on output and employment. The purpose of this article is to examine how significant the impact is likely to be.

## 2. Employment and output effects of the oil price collapse.

In the six months to June 1986 direct employment in firms with more than 80% of their employment in the North Sea oil and oil related sectors fell by 5,284 (Manpower Services Commission 1986). At the same time, there has been a variety of forecasts, business, academic and political, which have attempted to estimate both direct and indirect job losses in the Scottish economy due to the reduction in activity in these sectors. One previous estimate was made by the Fraser of Allander Institute, in its June 1986 Business Forecasting Service report, when it was suggested that, on the assumption of a 10% fall in "exports to the Continental shelf" (the term used in the 1979 Scottish Input-Output Tables to describe current final expenditures associated with North Sea oil activity), around 8,000 direct and indirect Scottish jobs might be lost. That estimate was based on minimal information about the distributive effects of a fall in oil prices and on the degree of actual final expenditure loss. It assumed that none of the income lost through employment falls would be retained in the Scottish economy even at a reduced level i.e. the ameliorative effects of redundancy payments, social security etc were ignored.

Table 2.1 Main SIC (1980) sectors expected to incur job losses

SIC (1980)	Description
13	Extraction of Mineral Oil and Natural Gas
32	Mechanical Engineering (incl Module Manufacture etc).
34	Electrical & Electronic Engineering
50	Construction
61	Distribution & Supplies
66	Catering
74	Sea Transport
75	Air Transport
76	Supporting Services to Transport
77	Miscellaneous Transport & Storage Services
83	Business & Professional Services

In this article, an impact study based on a more detailed analysis of the sectoral employment effects associated with reduced activity in Scottish industries related to North Sea oil work has been undertaken.

It draws direct employment loss information from a study carried out by the Royal Bank of Scotland which estimates aggregate direct job losses. Table 2.1 shows the main Standard Industrial Classification (SIC) categories which are expected to be affected by the fall in oil prices.

The Royal Bank of Scotland study estimated that direct job losses in oil and oil related industries will total between 12,000 and 18,000 in the next two to three years. The estimate was drawn from North Sea assumptions forecasts under two future oil price scenarios. The Royal Bank's "Case A" postulates prices which are low and, in particular, volatile between \$10 and \$20 for the rest of the decade followed by a sharp escalation in real terms. "Case B" anticipates a gradual recovery in prices from \$15 next year to reach \$25 in 1990, after which there would be a gentle appreciation in real terms. Under these two scenarios the Royal Bank forecast detailed field developments for the UK Continental Shelf for both oil and gas. These forecasts were then, with other assumptions, used to drive the SDA's North Sea expenditures model to derive estimates of the North Sea marketplace over the next decade. Crucially, the Royal Bank assumed a 30% drop in development costs to bring the 1984 coefficients in the model into line with current market conditions; this cost reduction assumed to continue in future years as a result of improved technology. The effect of this assumption was that significantly more developments were forecast to proceed than has been suggested by other forecasters but at the cost of a lower economic impact per project.

The out-turn under both price scenarios shows a similar number of projects coming on stream in the years to the end of the century. "Case A" suggests a further forty-five oil projects and twenty-six gas fields on stream by 1998 while "Case B" anticipates forty-seven oil projects and some twenty-five gas developments. However, there are major differences in the timing of oil field developments. In the years to 1991 "Case A" would produce only eleven new oil field developments while "Case B" would see twenty-one such fields. The consequences of these different development pictures on the 'North Sea marketplace' are shown in Table

2.2. The figures represent not total expenditure on oil and gas development but the market of oil company external expenditures which in 1984 represented 58% of total expenditure.

**Table 2.2 Forecast orders placed for goods and services UKCS (\$m 1984 prices) under two price scenarios**

	81-85 Total	86-90 Total	91-95 Total	86-95 Total
<b>Case A</b>				
Exploration	2,220	1,235	1,986	3,221
Development	7,979	4,629	6,591	11,220
Production	528	533	687	1,220
General services	4,771	4,079	5,417	9,496
<b>Total</b>	<b>15,498</b>	<b>10,476</b>	<b>14,681</b>	<b>25,157</b>
<b>Case B</b>				
Exploration	2,220	1,517	1,784	3,301
Development	7,979	6,440	5,873	12,313
Production	528	537	767	1,304
General services	4,771	4,293	5,825	10,118
<b>Total</b>	<b>15,498</b>	<b>12,787</b>	<b>14,249</b>	<b>27,036</b>

Source: Royal Bank of Scotland

The implications of the current oil price position for the marketplace can be seen clearly. "Case A" results in a market over the next five years of some 68% of the 1981-85 period. In the years 1991-95, however, expenditure would bounce back to 95% of 1981-85. Under "Case B" the decline is more gentle, to some 83% of 1981-85 over the next five years, with a recovery to 92% in the 1990s. The Royal Bank went on to project what these figures could mean for employment in the industry recognising that an element in current job losses may have occurred regardless of any sharp price fall. The conclusion arrived at was that job losses over the next two years, from the beginning of 1986, could total twelve-eighteen thousand depending on whether oil price movements approximated to the pattern of "Case A", leading to the higher estimate of job losses, or "Case B" producing direct job losses in the range of twelve thousand. In both cases there would be some employment recovery in the 1990s.

Taking these two aggregate figures as low and high estimates of direct job loss, a share can be apportioned to each of the

eleven SIC categories identified in Table 2.1 (the share of employment decline in each sector is distributed by weighting each sector according to its importance in total employment represented by the 11 categories). Table 2.3 contains high and low estimates of the sectoral direct employment loss.

**Table 2.3 Low and high estimates of direct job loss (apportioned by sector)**

SIC (1980)	Direct job loss (low estimate)	Direct job loss (high estimate)
13	5,220	7,830
32	2,868	4,302
34	264	396
50	1,008	1,512
61	504	756
66	516	774
74	216	324
75	228	342
76	240	360
77	204	306
83	732	1,098

The next step in the process of estimating the total employment and output loss resulting from these direct job losses is to distribute the SIC (1980) sectoral totals over the relevant input-output sectors contained in the 1979 Scottish Input-Output study (Industry Department for Scotland 1984). By doing this a direct output loss can be estimated (by multiplying direct employment loss by sector with the reciprocal of the appropriate employment:output coefficient) which will act as the primary raw data for estimating the total ie., direct plus indirect output and employment losses.

**Table 2.4 Direct and total output effects given the low and high estimates of direct job loss (1984 prices, £ million)**

Estimate	Direct output loss	Total output loss	Share of GDP per annum
Low	288.68	758.12	1.65%
High	434.43	1,137.27	2.5%

The impact study employed also takes into account the "Keynesian multiplier" effect of falls in consumers' expenditure brought about by these direct falls in output ie

"Type II" multipliers are calculated. The output results of this exercise are shown in Table 2.4.

The output multiplier associated with these direct output losses is 2.62 and, in each of the two years, the loss would account for 1.65% and 2.5% of Scottish Gross Domestic Product for the low and high estimates, respectively.

Turning to the sectoral employment results, the eighty-three Scottish input-output sectors are aggregated to some degree in order to present sectoral, total employment loss projections. These projections are contained in Tables 2.5 and 2.6 for the low and high direct employment loss estimates, respectively.

**Table 2.5 Total, sectoral employment loss in the Scottish economy over the next two years given 12,000 direct oil and oil-related job losses**

Sector	Direct job loss	Total job loss
Primary	-	618
Mineral oil & gas extract.	5,220	5,220
Mineral oil processing	-	3
Utilities	-	310
Metals, ores & build. materials	-	222
Chemicals & fertilisers	-	24
Industrial plant & steelwork	1,110	1,129
Metal goods & mech. eng.	1,758	1,880
Computers, comm. equip. etc	264	312
Transport equipment	-	45
Food, food processing & tobac.	-	316
Drink	-	81
Textiles, leather & clothing	-	91
Timber & furniture	-	86
Paper, board, printing etc	-	247
Rubber, plastics & other manuf.	-	54
Construction	1,008	1,797
Distribution	504	3,622
Hotels & catering	516	2,075
Transport	888	2,121
Business services	732	3,611
Other services	-	1,689
<b>Total</b>	<b>12,000</b>	<b>25,553</b>

The employment multiplier associated with the low and high estimates of direct job loss is 2.13. This multiplier is fairly high but represents the worst possible outcome from the direct job loss forecasts. The results of this exercise imply that no offsetting positive expenditures from redundancy payments, social security benefits or unemployment

benefit will take place in Scotland ie a result identical to the assumption that everyone losing their job migrates from the region. In order to provide an alternative picture of events it was assumed that a proportion of the household expenditure loss identified in the exercise was spent in Scotland.

**Table 2.6 Total, sectoral employment loss in the Scottish economy over the next two years given 18,000 direct oil and oil-related job losses**

Sector	Direct job loss	Total job loss
Primary	-	929
Mineral oil & gas extract.	7,830	7,830
Mineral oil processing	-	5
Utilities	-	465
Metals, ores & build. materials	-	331
Chemicals & fertilisers	-	35
Industrial plant & steelwork	1,665	1,695
Metal goods & mech. eng.	2,638	2,822
Computers, comm. equip. etc	396	470
Transport equipment	-	68
Food, food processing & tobac.	-	474
Drink	-	121
Textiles, leather & clothing	-	138
Timber & furniture	-	129
Paper, board, printing etc	-	371
Rubber, plastics & other manuf.	-	81
Construction	1,512	2,697
Distribution	756	5,434
Hotels & catering	774	3,122
Transport	1,331	3,182
Business services	1,098	5,412
Other services	-	2,532
<b>Total</b>	<b>18,000</b>	<b>38,333</b>

In the course of a previous study undertaken at the Institute, it was estimated that unemployment benefit receivable as a proportion of estimated disposable income was 29% (excluding supplementary benefit, redundancy payments etc). It is felt that this figure is somewhat low and that long-run ameliorative expenditure effects should also take into account migration rates, marriage/family profiles, unemployment duration rates and so on. This task involves a great deal of preparation and effort but still relies crucially on the assumptions made about future conditions in local labour markets and personal expectations about employment prospects. These elements are extremely difficult to assess accurately. Nevertheless, some adjustment upwards from the figure of 29% does seem appropriate and, on a judgemental basis, 35% is taken as the proportion of lost household income which should be added-back in the analysis.

**Table 2.7 Total employment loss based on a low estimate of direct job loss (12,000) and incorporating ameliorative expenditure effects**

Sector	Direct job loss	Total job loss
Primary	-	392
Mineral oil & gas extract.	5,220	5,220
Mineral oil processing	-	3
Utilities	-	214
Metals, ores & build. materials	-	204
Chemicals & fertilisers	-	15
Industrial plant & steelwork	1,110	1,128
Metal goods & mech. eng.	1,758	1,859
Computers, comm. equip. etc	264	299
Transport equipment	-	36
Food, food processing & tobac.	-	190
Drink	-	50
Textiles, leather & clothing	-	57
Timber & furniture	-	64
Paper, board, printing etc	-	196
Rubber, plastics & other manuf.	-	43
Construction	1,008	1,623
Distribution	504	2,324
Hotels & catering	516	1,739
Transport	888	1,861
Business services	732	3,023
Other services	-	1,242
<b>Total</b>	<b>12,000</b>	<b>21,782</b>

**Table 2.8 Total employment loss based on a low estimate of direct job loss (18,000) and incorporating ameliorative expenditure effects**

Sector	Direct job loss	Total job loss
Primary	-	588
Mineral oil & gas extract.	7,830	7,830
Mineral oil processing	-	4
Utilities	-	321
Metals, ores & build. material	-	306
Chemicals & fertilisers	-	24
Industrial plant & steelwork	1,665	1,692
Metal goods & mech. eng.	2,638	2,789
Computers, comm. equip. etc	396	449
Transport equipment	-	53
Food, food processing & tobac.	-	285
Drink	-	75
Textiles, leather & clothing	-	87
Timber & furniture	-	95
Paper, board, printing etc	-	293
Rubber, plastics & other manuf.	-	66
Construction	1,512	2,435
Distribution	756	3,485
Hotels & catering	774	2,608
Transport	1,331	2,792
Business services	1,098	4,537
Other services	-	1,862
<b>Total</b>	<b>18,000</b>	<b>32,676</b>

When this positive, offsetting expenditure effect is introduced into the analysis, job loss effects are tempered. Tables 2.7 and 2.8 contain details of the total sectoral employment losses using this less 'extreme' assumption about migration and expenditure patterns.

As can be seen from these tables, most of the improved employment effects come via the service sectors which were initially very badly hit through indirect effects. Total employment loss, using the low direct employment loss figures now stands at 21,782 (down 3,771 on the total reported in Table 2.5). Of this reduction, 2,929 jobs (78%) are in the service industries. For the high direct employment loss example, the new job loss total falls by 5,657 to 32,676. In this instance, the offsetting expenditure effects reduce the service sector employment fall by 4,388 (78% of the total ameliorative employment effect).

**Table 2.9 Total primary, manufacturing and service sector employment effects induced by direct oil sector employment falls of 12,000 and 18,000, respectively**

	Direct employment effect	Pro-portion	Total employment effect	Pro-portion
<b>Low estimate</b>				
Primary	5,220	44%	5,612	26%
Manufacturing	3,132	26%	4,144	19%
Services (inc. Construction & Utilities)	3,648	30%	12,026	55%
<b>TOTAL</b>	<b>12,000</b>	<b>100%</b>	<b>21,782</b>	<b>100%</b>
<b>High estimate</b>				
Primary	7,830	44%	8,418	26%
Manufacturing	4,699	26%	6,218	19%
Services (inc. Construction & Utilities)	5,471	30%	18,040	55%
<b>TOTAL</b>	<b>18,000</b>	<b>100%</b>	<b>32,676</b>	<b>100%</b>

Table 2.9 presents a summary picture of the employment loss effects emanating from

the present analysis (including expenditure add-back) by broad economic sectors.

It is clear from this table that the service sector bears the brunt of indirect job losses as might be expected from a Type II multiplier analysis. In this instance the employment multiplier has fallen to 1.82, a 15% decrease from the worst possible scenario.

### 3. CONCLUSION

The assumption made when using input-output tables in this kind of impact study is that the factors of production, for any commodity, are employed in fixed proportions. This allows us to use the "technological co-efficients" inherent in input-output tables for analytical purposes. However, this might not be the case. To the extent that the mix of factors of production has changed since 1979, firms are willing to hoard (mainly) skilled labour, firms reduce labour costs eg wages, perks etc rather than actual numbers, or firms use the current market difficulties as an excuse to discard employees in a "dead wood" trimming exercise, the multiplier effects suggested in this study could well be distorted. Nevertheless, given the drawbacks of the assumptions necessary to utilise the fixed input-output coefficients, the results detailed in Section 2 are, at least, plausible estimates of the 'possible' and 'likely' overall employment effects which might occur in Scotland as a result of the oil price scenarios detailed in Section 2.

Figures contained in the latest **Scottish Abstract of Statistics** (1985) put employment in companies wholly related to the North Sea oil industry at just over 64,000 in mid-1984. Grampian Region estimated in 1985 that total oil-related employment was over 63,000. The latest estimate, contained in the Manpower Services Commission study already referred to, put the number of persons more than 80% involved in oil-related work at 66,205 (and that after a fall of 5,284 (7.4%) on the figure of December 1985). Our direct job loss estimates of 12,000 to 18,000 take as their base figure the 1985 estimate of wholly plus 80%+ oil-related employment ie 71,500. Consequently, we estimate that at least 17% and possibly as much as 25% of oil industry employment in Scotland will have disappeared between the beginning of 1986 and the first quarter of 1988, given our oil price assumptions. This direct job loss effect is bound to fall most heavily in the Grampian Region,

which accounts for more than 70% of Scottish oil industry and related employment. Albeit that over a quarter of the Grampian labour force (and probably a rather higher proportion of the workers losing employment) are not resident in the region. Another area which is likely to suffer equally severely in terms of its local economy, if not in overall Scottish terms, is the Shetland Islands. However, direct and indirect effects will be felt throughout Scotland.

From the results of our 'likely' scenario, the Scottish unemployment rate looks set to rise, over the next two years, by between 0.9% and 1.3% **more than it would have done had the oil price fall not occurred.** It is undoubtedly the case that Scotland has an interest in a stable oil price regime at a higher crude oil price than this year. Evidence for this is forthcoming from the profile of development activity and, hence, employment loss, presented in the two Royal Bank oil price cases. In "Case A", where the price is highly volatile, ranging between \$10 and \$20 over the next few years, high direct and indirect job losses are the result. In "Case B" where prices are much more stable and higher than at present, the job loss figures are much less severe although still painful in economic terms. Consequently, any government policy decisions which would stimulate North Sea activity should be unambiguously welcomed north of the border. The relief on Advance Petroleum Revenue Tax announced by the Chancellor of the Exchequer goes some way towards helping the cash flow situation, especially for the independent oil companies. However, direct action to stimulate **development** activity, for example, co-operation with OPEC on pricing strategy and/or changes to the tax structure in the North Sea, shows no signs of emerging.

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